



STATE OF NORTH CAROLINA
DEPARTMENT OF TRANSPORTATION

BEVERLY EAVES PERDUE
GOVERNOR

EUGENE A. CONTI, JR.
SECRETARY

MEMORANDUM TO: Project Engineers
Project Design Engineers

FROM: G. R. Perfetti, P. E.
State Structures Engineer

DATE: October 31, 2011

SUBJECT: LATERAL BRACING OF LONG-SPAN STEEL GIRDERS

Steel girders can exhibit unanticipated behavior, e.g. buckling, after erection but prior to becoming composite with the concrete deck. If lateral bracing is not present, the weak-axis (transverse) bending stiffness can be significantly less than the strong-axis (vertical) stiffness. Loading conditions and erection stages that can contribute to the girder/frame instability include, but are not limited to, exposure to high wind loads, temporary erection stages consisting of two or three parallel girders, or girders cantilevered over a bent during erection. Therefore, the designer should consider the stability of steel girder bridges during all stages of construction and evaluate the need for lateral bracing near the top flange.

For steel girder spans less than 180'-0" (54.9 m), as a minimum, ensure the girder web and flanges are proportioned to satisfy the slenderness limits for shipping and lifting, as specified in the *AASHTO LRFD Bridge Design Specifications*. For spans greater than or equal to 180'-0" (54.9 m), adhere to the slenderness limits and detail lateral bracing near the top flange, throughout the exterior bays. Also, place the following note on the plans:

Install the lateral bracing after erecting the exterior girder and the adjacent interior girder and installing the intermediate diaphragms.

A new standard drawing, LB1 – Lateral Bracing has been developed and should be used in plan development. Use the table below to select the size of the lateral bracing members. The lateral bracing member size should be determined by the designer when the unbraced length exceeds the value shown in the table.

Member Size	Max. Unbraced Length
L 5 x 5 x ½	16'-3" (4.95m)
L 6 x 6 x ½	19'-6" (5.94m)

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The standard drawing is available on both the network drive and the Structure Design web site. Show the lateral bracing on the Superstructure Framing Plan sheet and include the Lateral Bracing sheet with the Structural Steel Details sheets in the Contract Plans.

This policy is effective with the April 2012 letting. Section 6.6.10 of the Design Manual and the Standard Notes have been updated.

GRP/GM

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